National Emission Standard for Hazardous Air Pollutants
for Secondary Aluminum Production
Subpart RRR

# Group 1 Furnace

The requirements apply to furnaces of any design that melt, hold, or process aluminum that contain paint, lubricants, coating or other foreign materials with or without reactive fluxing or process clean charge with reactive fluxing.

Owners or operators of secondary aluminum production facilities must meet all the following requirements by March 24, 2003:

note: **Area Sources are only required to meet emission limits for D/F and associated operating, monitoring and reporting requirements.**

## Regulated Pollutants & Emission Limits:

see Table 1 s.63.1505(i) & (j)

Use these limits to determine emission standards for Secondary Aluminum Processing Unit (SAPU)

| Pollutant | Limit (major sources) | Alternate Limit ( for units processing Only Clean Charge[1]) |
|---|---|---|
| PM[2] (particulate matter) | 0.40 pounds/ton of feed/charge (0.20 kg/Mg charge) | 0.80 pounds/ton of feed/charge (0.40 kg/Mg charge) |
| HCl (hydrogen chloride) | 0.40 pounds/ton of feed/charge (0.20 kg/Mg charge) or | 0.40 pounds/ton of feed/charge or (0.20 kg/Mg charge) or |
| HCl If furnace has add-on control device: | 10%(wt) of uncontrolled HCl emissions | 10%(wt) of uncontrolled HCl emissions |
| D/F TEQ (dioxin/furan toxic equivalent units) | $2.1x10^{-4}$ grains per ton of feed/charge (15 ug/Mg charge) | Limit does not apply |
| Visible Emissions If furnace has add-on control device and COM | 10% opacity | |

Sidewell Furnaces that conduct reactive fluxing in hearth or reactive fluxing in sidewell when level of molten metal falls below the top of the passage between the sidewell and hearth:

PM: 0.01 pound/ton of feed/charge (0.005 kg/Mg)
HCl: 0.04 pound/ton of feed/charge (0.02 kg/Mg)
10% opacity for units equipped with add-on control and COM

these limits apply for **combined** hearth and sidewell emissions

Induction Furnace
Unit 1
D/F Limit: 2.1x10-4 gr/ton
Control: afterburner
Charge: X ton ignot
Flux:

## Operational Standards:

see Table 2 s.63.1506(a),(b),(c),(d) & (m),(n)

- LABEL each unit with:

[1] Clean charge means T-bar; ingot; billet; pig; alloying elements; scrap known to be free of paint, coatings, lubricants; chips that have been thermally dried; scrap dried at 650°F or higher; scrap delacquered at 900 °F or higher and runaround scrap.

[2] Emission limitations for particulate matter include only front-half emissions following EPA method 5.

Type of Unit
Emission Limit and means of compliance
Operational Standard and Control Method (work practice or control device)
Operating Parameters (such as type of charge used; flux materials, addition practices, afterburner operating temperature and residence time)

- Inspect emission unit and control device(s) once per month
- Operate a device that records the weight of each charge or production weight
- For Furnaces with Lime Injected Fabric Filter used to meet emission limits:
    - Maintain average **inlet temperature** to fabric filter at or below temperature established in performance test plus 25$^{o}$F
    - Maintain **free-flowing lime** in hopper and settings at level established in performance test
    - Maintain total reactive chlorine **flux injection rate** at or below rate established during performance test.
    - Operate a bag leak detection system or continuous opacity monitor (COM) and establish corrective actions in OM&M plan. Operate so Alarm sounds <5% of operating time.
    - Operate in accordance **with OM&M plan**
- For Furnaces without Add-On Control Devices used to meet emission limits;
    - Maintain total reactive chlorine **flux injection rate** at or below rate established during performance test.
    - Operate according to **work practice**/pollution prevention measures documented in OM&M plan
    - Operate using only **clean charge** as the feedstock.
- Initiate Corrective Action when process or operating parameters deviate from those established in OM&M plan.

Sidewell Furnace:

- Operate so that molten metal remains above the top of the passage between the side-well and hearth during reactive flux injection. –unless equipped with add-on control device.
- Reactive flux is added only in sidewell unless emissions from the hearth are controlled with add-on control device.

**Monitoring Requirements:** see Table 3 s.63.1510 (b)-(f), (h),(l), (j), and (n)-(q)

- Develop and follow an Operation, Maintenance & Monitoring **(OM&M) Plan**:
  See standard for specific requirements {fact sheet}
- Install, calibrate, operate/monitor and maintain a device to measure and record total weight of feed/charge to furnace
- Install, calibrate, operate/monitor and maintain a device to continuously measure and record the weight of reactive flux injected (see standard for specifics on system)
- Fabric Filters and lime injected Fabric Filters:
  Install, calibrate, maintain and operate bag leak detection system or continuous opacity monitoring system (COM)
  Install, calibrate, maintain and operate a device to continuously monitor and record the inlet temperature to fabric filter see standard for monitoring system specifics.
  Verify lime is always free flowing and record setting once per day.
  Inspect lime feed hopper or silo once each 8-hour period

Monitor concentration of HCl at outlet of fabric filter.

- Sidewell Furnace with Add-On control device:
  Record for each charge level of molten metal to confirm level was above passage between hearth and sidewell, unless both equipped with control device.
  Submit certification of compliance with operational standards for each 6 month reporting period.
- Furnaces Without Add-On Control Devices:
  Develop Site Specific Monitoring plan **(SSM)** in consultation with WDNR
  Develop and follow a **Scrap Inspection Program or Scrap Contamination Monitoring Program.** This program is to be included as part of the SSM plan

| **Scrap Inspection Program Requirements** | **Scrap Contamination Monitoring Program Requirements** |
|---|---|
| Proven method to collect representative samples | Calculation Method |
| Method to measure oil and coatings content | Procedures for characterization of distinct scrap types |
| Scrap inspector training program | Documentation of contaminant level of scrap prior to performance test |
| Correlation between visual inspection and physical measure of oil and coatings content | Limitations on the furnace feed/charge including the proportion of scrap of each distinct type used during performance test |
| Comparison of randomly selected scrap with visual inspection results for oil and coatings | Method to ensure that no scrap with a contaminant level higher than that used in performance test is charged to the furnace |
| System to assure only acceptable scrap is charged to furnace | Certification of scrap contaminant level |
| Record keeping requirements to document conformance with plan | |

- Emissions capture and collection systems:
  Design and Install according to ACGIH approved methods
  Inspect annually to show operating according to ACGIH

**Performance Testing – Compliance Demonstration Requirements:**

See also s.63.1511 & s.63.1512(d)&(e)

Performance testing is required at the furnace exhaust outlet or the outlet of the Control Device.

Note: testing is allowed on representative emission units with approval of permitting authority (WDNR-Air Management Program)

- All Testing must be completed prior to March 23, 2003.

A. General Requirements:

- Prepare and submit a **Site-Specific Testing Plan** for approval to your Department of Natural Resources (DNR) Air Management compliance inspector. Plan contains: test program summary; test schedule; Data quality objectives; Internal/external Quality Assurance program.

- Conduct the **Initial Performance Test** and report results in Notification of Compliance Status Report (NOCS). Performance testing is used to establish operating parameters/ranges and is required every 5 years. {see fact sheet and example}.

B. Requirements for Add-On Control Devices used to meet emission limits:

- Furnaces that process other than Clean Charge must test for:
  PM, D/F and HCl at outlet of lime-injected fabric filter
- Furnace that process Only Clean Charge must test for:
  PM and HCl at outlet of lime-injected fabric filter

  Note: Testing for HCl is not required if operator assumes all reactive flux is emitted to calculate emissions and emissions of HCl are below limitations.
- Establish minimum/maximum operating parameter values and submit in NOCS for
  - Feed rate/charge rate: measure and record the total weight of feed/charge to unit.
  - Flux Injection Rate: for reactive chlorine flux addition
    - Continuously measure and record weight of flux injected for each 15 minute period during HCl and D/F tests.
    - Determine and record 15 minute block average and 3 hour block average weights and total weight for 3 test runs.
    - Record the identify, composition, and total weight for each addition of solid reactive flux for test runs
    - Determine total reactive chlorine flux injection rate by the equation:

      $$W_t = F_1W_1 + F_2W_2$$

      Where: $W_t$ is the total chlorine usage by weight
      F1 is the fraction of flux that is chlorine
      F2 is the fraction of solid flux that is chlorine *(example: F=0.75 for magnesium chloride)*
      W1 is the weight of reactive flux gas injected
      W2 is the weight of solid reactive flux

  - Lime injected Fabric Filters: for units using lime injected fabric filters to meet emission limits:
    - Inlet temperature; continuously measure and record every 15minutes.
    - Determine and record 15 minute block average and 3 hour block average temperatures.
    - Establish value for feeder setting, for each operating cycle or time period, by recording the setting during the performance test runs.
    - Ensure lime in feed silo is free flowing at all times and record setting once per day.
  - Provide information in the NOCS that capture/collection system meets the standards established in the American Conference of Governmental Industrial Hygienists "Industrial Ventilation: A Manual of Recommended Practice" chapters 3 and 5.
  - Sidewell Furnaces that conduct reactive fluxing in hearth or conduct reactive fluxing in sidewell at times when level of molten metal falls below hearth, emissions must be measured (tested) from **both** the sidewell and the hearth.

C. Requirements for Furnaces Without Add-On Control Devices
includes melting holding furnaces.

- Furnaces that process other than Clean Charge must test for:

PM, D/F and HCl at the furnace exhaust outlet

- Furnace that process Only Clean Charge must test for:
  PM and HCl at the furnace exhaust outlet
- Note: Testing for HCl is not required if operator assumes all reactive flux is emitted to calculate emissions and emissions of HCl are below limitations.

D. Equations for Determining Compliance: see s. 63.1513

| Pollutant | Compliance Equation | Test Method |
|---|---|---|
| THC (total hydrocarbons as propane) | $E = \frac{C \times MW \times Q \times K_1 \times K_2}{M_v \times P \times 10^6}$ | EPA Method 25A |
| PM (particulate matter) | $E = \frac{C \times Q \times K_1}{P}$ (equation 7) | EPA Method 5 |
| HCl (hydrogen chloride) | $E = \frac{C \times Q \times K_1}{P}$ (equation 7) | EPA Method 26A |
| D/F TEQ (dioxin/furan toxic equivalent units) | $E = \frac{C \times Q \times K_1}{P}$ (equation 7) | EPA Method 23 |

Where:

E= emission rate in (lb/ton)

C= concentration in (gr/dscf)

Q= volumetric flow rate of exhaust gas in (dscf/hr)

K1= conversion factor (1 lb/7000gr)

P= production rate (ton/hr)

MW=molecular weight THC as propane

K2=conversion factor ($1ft^3/ft^3$)

**Notifications:** see s. 63.1515

Notifications and Reports should be submitted to Department of Natural Resources-Air Management Program. They may be submitted as an amendment(s) to your facility Operation Permit application. NOCS should also be submitted to EPA Region V.

- Initial Notification
- Notification of Compliance Status **(NOCS)**: submit by- **May 24, 2003**
  Must be signed by responsible official to certify accuracy.
  - **Includes:** **Methods used to Determine Compliance**
    **OM&M plan;** Operation, Maintenance & Monitoring
    **SMM plan;** Startup, Shutdown and Malfunction including Scrap Inspection program
    **Site Specific Test Plan;** approved
    **Results of Performance test**
    **Compliant operating Parameters value/range**
    **Manufactures specifications/design for afterburner**
    **Capture/Collection equipment Design information**
    **Unit Labeling Procedures**

**Reports:** see s. 63.1516 & s. 63.1517

- Startup, Shutdown and Malfunction Plan/Reports (SSM) plan:{see example}

- Excess Emission Summary Report- submit semiannual (every 6 months) includes:
  - Corrective actions not taken within 1 hour
  - Excursion of Compliant operating parameter(s) including temperature
  - Startup, shutdown or malfunction did not follow procedures in SSM plan
  - If **no** deviations from established parameters; report *"No Excess Emissions"*

- Annual Compliance Certification: {see example}

## Specific Requirements for Add-On Control Devices used to meet Limits

Fabric Filters

- Install and Operate a Bag Leak Detection System with Alarm or Continuous Opacity Monitor
- Follow OM&M plan
- Initiate Corrective Action within 1 hour of alarm
- Operate so Alarm sounds less than 5% of operating time
- Record: Inlet Temperature in 15 min intervals
  3-hr Block Average Temperature
  Excursions from operating values, cause and corrective action

Afterburner and Lime-Injected Fabric Filter

- Operate Afterburner Temperature at or above temperature established in Performance Test
- Follow OM&M plan
- Inspect Annually- keep records of inspection
- Maintain Inlet Temperature to Fabric Filter at or below temperature established in Performance Test ($+25^{o}F$)
- Maintain free flowing lime in hopper or silo at all times
- Operate with lime Feeder setting/injection rate within range established during Performance Test
- Record: Afterburner operating temperature in 15 min intervals
  3-hour Block Average Temperature of Afterburner
  Inlet Temperature to Fabric Filter in 15 min block averages
  Excursions from operating values, cause and corrective action
  Lime feeder setting or injection rate
  Total Operating Hours, and records of each alarm

## Requirements needing approval of permitting agency (WDNR-AirManagment Program)

- Type of System, operation and maintenance of method(s) used for lime injection
- Device and operation of system to monitor concentration of HCl at outlet of fabric filter.
- Site Specific Monitoring Plan (SSM) to address PM, HCl and D/F emissions-see specific requirements in standard and fact sheet {link to EPA website materials}
- Site Specific Test plan for initial performance test and any subsequent emission testing.